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10/02/2003

JOHN E BECK  
XEROX CORPORATION  
XEROX SQUARE 20A  
ROCHESTER, NY 14644

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| EXAMINER |
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VIDA, MELANIE M

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| ART UNIT | PAPER NUMBER |
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2697

DATE MAILED: 10/02/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/362,021

Applicant(s)

MEYER ET AL.

Examiner

Melanie M Vida

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Terminal Disclaimer***

1. The terminal disclaimer filed on 6/30/03 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of U.S. Application 09/362,022 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Response to Arguments***

2. In response to the Office Action mailed on April 1, 2003, applicants have submitted an amendment for reconsideration filed on 6/30/03 arguing to traverse the rejection of pending claims 1-22.

### ***Response to Amendment***

3. Applicant's argument with respect to claim 1, have been considered but are moot in view of the new ground(s) of rejection. In view of the Applicant's remarks, it is agreed that Mailloux does not teach the auxiliary pixels as disclosed in the specification, on pg. 11, lines 15-18, "that is, auxiliary pixels, 106 & 108... may be of sub-critical density, that is below the normal density threshold for printout in their respective regions so that they are non-printing in effect". Thus a new ground of rejection is applied below.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1-22** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding, **claim 1**, the Examiner cites “where a first auxiliary pixel of said auxiliary pixels is in replacement of an original pixel of said original pixels for enhancing the printing of the original image”, as being unclear after further investigating the Applicant’s disclosure. The specification on pg. 11, lines 31-32, recites “the addition of such small non-printing pixels to a digital image will move the toner cloud toward or away from the photoreceptor in the neighborhood of an area to be developed. The Examiner finds no support in the specification for the “where a first auxiliary pixel of said auxiliary pixels is in replacement of an original pixel” as cited in the claim language, (claim 1, lines 4-5).

Regarding, **claims 2-3**, the Examiner cites the claims, “the first auxiliary pixel comprises a “black” auxiliary pixel”, and “the first auxiliary pixel comprises a “white” auxiliary pixel”, (claim 2, lines 1-2; claim3, lines 1-2, respectively). However, after reading the specification, there are two distinct definitions for a black auxiliary pixel and a white auxiliary pixel. For example, the specification on pg. 11, lines 5-8, defines a white auxiliary pixels as a “non-printing pixel that is placed exterior to an image shape”, and a black auxiliary pixel as a “non printing pixel that is placed interior to an image shape”. The examiner also cites a different definition for

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the respective “black” and “white” auxiliary pixels in the specification on pg. 11, lines 31-34, wherein a “black” auxiliary pixels is “on” pixels in an otherwise off area. The specification recites that “white” auxiliary pixels are “off” pixels in an otherwise “on” area.

Regarding, **claims 7-10, 13-15**, the Examiner can find no support in the specification for the following:

“A second auxiliary pixel, wherein the first auxiliary pixel and the second auxiliary pixel are spaced from the image”, (claim 7, lines 1-3).

“the first auxiliary pixel and the second auxiliary pixel being equally distant from the original image shape”, (claim 8, lines 1-3).

“the first auxiliary pixel and the second auxiliary pixel are at least one pixel distant from the original shape”, (claim 9, lines 1-3).

“the first auxiliary pixel and the second auxiliary pixel are at least two pixels distant from the original image”, (claim 10, lines 1-3).

“the pattern of auxiliary pixels is clustered about a shape edge found in the original image”, (claim 13, lines 1-2).

“the clustered auxiliary pixels are in a checkerboard pattern”, (claim 14, lines 1-2).

“the pattern of auxiliary pixels is a dispersed array close to a shape edge found in the original image”, (claim 15, lines 1-3).

Regarding, **claim 12**, the examiner recites the claim, “a pattern of auxiliary pixels is substituted for a corresponding pattern of original pixels in the original image”, as unclear. After reading the specification, on pg. 11, lines 31-32, recites “the addition of such small non-printing pixels to a digital image will move the toner cloud toward or away from the

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photoreceptor in the neighborhood of an area to be developed. The Examiner finds no support in the specification for the “a pattern of auxiliary pixels is substituted for a corresponding pattern of original pixels in the original image” as cited in the claim language, (claim 12, lines 1-3).

The term “**auxiliary pixels**” in **claims 1-22** are used by the claim to mean “non-printing pixels”, while the accepted meaning is “pels or pixels to be rendered on an image recording medium”. The term is indefinite because the specification does not clearly redefine the term, (pg. 11, lines 15-30).

The term “**black auxiliary pixel**” in claim 2 is used by the claim to mean “a non-printing pixel that is placed exterior to an image shape”, while the accepted meaning is an “on bit, or a gradation value of 255”. The term is indefinite because the specification does not clearly redefine the term, (pg. 11, lines 5-7).

The term “**white auxiliary pixel**” in claim 3 is used by the claim to mean “a non-printing pixel that is placed interior to an image shape”, while the accepted meaning is “off bit, or a gradation value of 0”. The term is indefinite because the specification does not clearly redefine the term, (pg. 11, lines 5-7).

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-6, 11, 12, 16, 17, 19, 21** are rejected under 35 U.S.C. 102(b) as being anticipated by Chung, (USP 5,818,504, hereinafter, Chung).

Regarding, **claim 1**, Chung has a laser printer, as shown in figure 8, with a method for an improved image pattern, which reads on “an improved print image”, (col. 7, lines 24-25). Further, Chang teaches of pixels (51)-(59), as shown in figures 5 and 6, which reads on “auxiliary pixels”, that surround a center pixel (50), but are insufficient to result in enough depletion to create an image, (col. 7, lines 18-23). Further, as best understood by the claim language, Chung inherently teaches, “where a first auxiliary pixel of said auxiliary pixels is in replacement of an original pixel of said original pixels for enhancing the printing of the original image” as evidenced by the non-printing pixels (51)-(59) are energized for short time periods to enhance or expand the center pixel (50) outward, but are energized with too short of time period to result in the creation of additional pixels in the image”, (col. 7, lines 20-23).

Regarding, **claim 2**, as best understood by the claim language, Chung teaches of increasing the toner at pixel (43) with additional optical energy applied adjacent to the pixel (43), as represented by small circles (45) and (46), which reads on “wherein the first auxiliary pixel comprises a “black” auxiliary pixel”, (col. 6, lines 50-57).

Regarding, **claim 3**, as best understood by the claim language, Chung teaches of selectively narrowing the charge pattern in an image where certain regions of imaging are excessive, which reads on “wherein the first auxiliary pixel comprises a white auxiliary pixel”, such that the duration of energy applied to the photoreceptor will reduce the pixel, (col. 9, lines 15-20).

Regarding, **claim 4**, Chung teaches of additional optical energy applied adjacent to the pixel (43) as represented by small circles (45) and (46), which reads on “the original image further comprising an original image shape wherein the first auxiliary pixel is adjacent to the original image shape”, (col. 6, lines 15-20).

Regarding, **claim 5**, as best understood by the claim language, please refer to the corresponding rejection in claim 3.

Regarding, **claim 6**, as best understood by the claim language, please refer to the corresponding rejection in claim 2.

Regarding, **claim 11**, Chung teaches the use of Resolution Enhancement technology (RET) to selectively expand the charge pattern or selectively narrow it, which reads on “wherein the first auxiliary pixel adjacent the original image is deployed as a RET type”, (col. 6, lines 30-35; col. 9, lines 14-16). Further, the comparing of pixels to known pixel patterns using RET to detect irregularities in a print image, reads on “so as to smooth out jagged stair-case transitions”, (col. 6, lines 27-29).

Regarding, **claim 12**, as best understood from the claim language, Chung teaches of a pattern of pixels (51-59), as shown in figure 6, which reads on “a pattern of auxiliary pixel”, to enhance a center pixel (50), such that the pattern of pixels are energized with short time periods



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insufficient to create an image, but allow the pixel (50) to outwardly expand, which reads on “is substituted for a corresponding pattern of original pixels in the original image”, (co. 7, lines 18-23).

Regarding, **claim 16**, as best understood from the claim language, Chung has a laser printer, as shown in figure 8, with a method for an improved image pattern, which reads on “a method for improving the printing of an image”, (col. 7, lines 24-25). Chung teaches that a laser printer scans a line divided into pixels areas and modulates the laser beam so that the selected pixel areas are exposed to light, which reads on “receiving a source image of original pixel data”, (col. 1, lines 32-38). Further, Chung teaches the selected center pixel (50) is surrounded by pixels (51-59), as shown in figures 5-6, energized for short periods of time insufficient to create printed pixels in an image, but allow the center pixel (50) to expand outwardly, which reads on “processing the source image original pixel data to embed auxiliary pixels therein”, (col. 7, lines 18-23).

Regarding, **claim 17**, Chung inherently teaches “the processing involves morphologically manipulating the original pixel data to substitute auxiliary pixels for original data pixels”, as evidenced by the process of comparing pixels to known pixel patterns to adjust for charge irregularity using the Resolution Enhancement Technology (RET), (col. 6, lines 30-38).

Regarding, **claim 19**, as best understood by the claim language, please refer to the corresponding rejection in claim 16.

Regarding, **claim 21**, please refer to the corresponding rejection in claim 17.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 7-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (USP 5,818,504) as applied to claim 1 above, and further in view of Mailloux (USP 5,555,557, hereinafter, Mailloux).

Regarding, **claims 7-8**, Chung teaches the “improved image of claim 6”, but fails to expressly disclose “comprising a second auxiliary pixel, wherein the first auxiliary pixel and the second auxiliary pixel are spaced from the image”.

However, Mailloux, inherently, teaches **claims 7, and 8**, where  $Z_2$ , which reads on “a second auxiliary pixel”, and  $Z_1$ , which reads on a “first auxiliary pixel”, are equally spaced from the image shape, a vertical 2-pixel thick line, which reads on “are spaced from the image” in claim 7, and “being equally distant from the original shape” as in claim 8.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Chung’s improved print image, with Mailloux’s pixel spacing from the image.

One of ordinary skill in the art would have been motivated to space the auxiliary pixels according Mailloux, to symmetrically modify the image, given the express suggestion of Mailloux, (col. 4, lines 57-59).

Regarding, **claim 9**, Chung illustrates in figure 2, adjacent pixels (31), (32) that are not imaged, which reads on “a first auxiliary pixel”, “second auxiliary pixel” respectively, that assist

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the intermediate region represented by the solid arrow (34), which reads on “are at least one pixel distant” to produce sharp borders to the solid areas, which reads on “from the original image shape”, (col. 6, lines 3-10; lines 13-16).

Regarding, **claim 10**, Chung inherently teaches “wherein the first auxiliary pixel, and the second auxiliary pixel, are at least two pixels distant from the original image” as illustrated in figure 7D, a dot pattern, of four 1/8 pulse length, represented by the hexadecimal, to enhance a single isolated pixel (43), shown in figure 3, (col. 7, lines 35-39).

**Claims 13-15, 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (USP 5,818,504) (hereinafter, Chung), and further in view of Bracco, et al. (USP 6,181,438 B1), (hereinafter, Bracco).

Regarding, **claim 13**, Chung teaches the improved image of claim 12, and a pattern of auxiliary pixels, but fails to expressly disclose, “the pattern of auxiliary pixels is clustered about a shape edge found in the original image”.

However, Bracco teaches that a control signal (T) may be a periodic pattern that is ANDed with a border region B, which reads on “the pattern of auxiliary pixels is clustered about a shape edge found in the original image”.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Chung’s auxiliary pixels with Bracco’s pattern of auxiliary pixels around a shape edge.

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One of ordinary skill in the art would have been motivated to use a pattern of auxiliary pixels, instead of a first auxiliary pixel, in order to enhance computational efficiency with matrix algebra.

Regarding, **claim 14**, Bracco teaches of a control signal (T), where the control signal (T) is a checkerboard pattern, which reads on “the clustered auxiliary pixels are in a checkerboard pattern”, (col. 6, lines 13-20).

Regarding, **claim 15**, Chung teaches the improved print image of claim 12, and a pattern of auxiliary pixels, but fails to expressly disclose “the pattern of auxiliary pixels is a dispersed array close to a shape edge found in the original image”.

However, Bracco teaches of a control signal T comprised of a random pattern of pixels that is ANDed with a border B in an image, which reads on “the pattern of auxiliary pixels is a dispersed array close to a shape edge found in the original image”, (col. 6, lines 14-20).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Chung’s auxiliary pixels with Bracco’s pattern of auxiliary pixels around a shape edge.

One of ordinary skill in the art would have been motivated to use a pattern of auxiliary pixels, instead of a first auxiliary pixel, in order to enhance computational efficiency with matrix algebra.

Regarding, **claim 20**, Chung teaches the digital imaging system of claim 19, but fails to expressly disclose a digital front end.

However, Bracco teaches of an image input device, which reads on “a digital front end”, (col. 4, lines 43-45).

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At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Chung's digital imaging system with Bracco's digital front end.

One of ordinary skill in the art would have been motivated to use a digital front end, in order to receive an image by a scanning operation, given the express suggestion of Bracco, (col. 4, lines 45-47).

**Claims 18, and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (USP 5,818,504) (hereinafter, Chung), as applied to claim 17 above, and further in view of Bracco, et al. (USP 6,181,438 B1), (hereinafter, Bracco), and further in view of Tung, (USP 4,847,641, hereinafter, Tung), as cited by applicant.

Regarding, **claim 18**, Chung teaches the method for improving the printing of an electrostatic image of claim 17, but fails to expressly disclose the "storing the source image in a first memory space", "replicating the source image as a working image in a second memory space", "outlining the first resultant working image to produce outline pixels in a second resultant working image", "substituting auxiliary pixels for the outline pixels in the second resultant working image".

However, Bracco inherently teaches "storing the source image in a first memory space" as evidenced by a second memory that is separate from where the input image data is stored, (col. 10, lines 10-12). Further, Bracco teaches a symbol for dilation, which reads on "dilating", (col. 9, lines 1-2). The dilating symbol is shown in equations 3, and 5, for thickening a black structure, and to widen a white region after finding the outer border, respectively, which reads on "dilating the working image to produce a first resultant working image", (col. 5, lines 54-55, 61-65). Bracco teaches the step to isolate structures, such as a border region, that may need

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thickened or thinned to change an image density, which reads on “outlining the first resultant working image to produce outline pixels in a second resultant working image”, (col. 5, lines 15-18; Eq. 1). After the border has been found, Bracco uses a quarter pixel (sub-pixel) video engine to selectively apply differing amounts of darkening (lightening) to areas, which reads on “substituting auxiliary pixels for the outline pixels in the second resultant working image”, (col. 6, lines 50-55; col. 7, lines 43-48). Bracco teaches that dilation is the same as logically “Oring” selected translates of the image, which reads on “performing an OR operation”, (col. 6, lines 5-8).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Chung’s method for improving the printing of an image, with Bracco’s steps for improving a print image.

One of ordinary skill in the art would have been motivated to use Bracco’s steps of improving a print image, in order to morphologically manipulate it.

However, Chung in view of Bracco do not expressly disclose “performing an OR operation of the second resultant working image with the source image in the first memory space, to thus produce auxiliary pixels in the source image at those pixel locations corresponding to the outline data in the second resultant working image”.

However, Tung teaches of piece-wise matching logic network (103) that compares an OR matrix, with an input bit map pattern, which reads on “performing an OR operation of the second resultant working image with the source image in the first memory space”, such that the associated compensation subcell output will be activated by a Logic OR, which reads on “to

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produce auxiliary pixels in the source image at those pixel locations corresponding to the outline data in the second resultant working image”, (col. 12, lines 27-32).

At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify Chung in view of Bracco’s method for improving the printing of an image, with Tung’s OR operation to produce auxiliary pixels.

One of ordinary skill in the art would have been motivated to perform an OR operation to produce auxiliary pixels, in order to reduce distortion in the original bit map image, given the express suggestion of Tung, (col. 12, lines 61-64).

Regarding, **claim 22**, please refer to the corresponding rejection in claim 18.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gwaltney et al. USP 6,456,394, method for reducing halo print defects associated with color images.

Awadalla et al. US Pre-Grant Publication, 2001/0012111 A1, a method to develop toner mass control using split subpixel laser modulations.

Chung, US 5,835,123, a dot enhancement for laser imagers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie M Vida whose telephone number is (703) 306-4220.

The examiner can normally be reached on 8:30 am 5:30 pm.

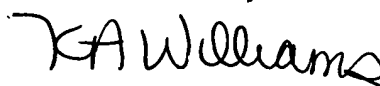
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly A Williams can be reached on (703) 305-4863. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Melanie M Vida  
Examiner  
Art Unit 2697

MMV  
September 16, 2003



Kimberly A. Williams  
Primary Examiner  
Technology Center 2600